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Earl Core Student Report

Passionflowers and a Clever Trick

By Nichole Long-Aragon

When most people observe butterflies in their garden, they visualize a peaceful scene. Even when most botanists think of butterflies and their association with plants, they think of butterflies sipping nectar and distributing pollen from one flower to another. However, some of these beautiful butterflies do more than peaceful activities: they lay their eggs on plants. Once these eggs hatch, they develop into caterpillars which subsequently feed on the leaves. This causes defoliation, or sometimes even plant death. Several species of a genus of plants well known to botanists of the eastern United States, the passionflowers (*Passiflora*), have developed a deceptive scheme to discourage this crime of passion. They trick the butterflies with egg mimics.

Egg mimics of Passiflora allantophylla. Left – color photograph showing bright yellow egg mimics. Right – scanning electron micrograph of abaxial leaf surface.

Female butterflies of the genus *Heliconius* inspect exposed structures of passionflowers before committing to egg placement. Females avoid a plant if it is already occupied by eggs and are believed to abstain from ovipositing on the plants because they do not want their offspring to compete with other caterpillars for a single food source. Thus, some species of *Passiflora* have evolved egg mimics to deter gravid butterflies from laying their eggs on the leaves. While this is a famous example of co-evolution, relatively little is actually known about the egg mimics themselves.

In my research I address four main questions: 1. Where are the mimics found on the plants? Are mimics in different places morphologically and anatomically similar? 2. What criteria need to be met in order to be considered an egg mimic? For example, does the mimic need to be a specific color, such as yellow or orange, to successfully mislead the butterfly? 3. What is/are the primary function(s) of the egg mimics? Do they only cause the female butterfly to avoid egg placement, or are there other benefits to possessing egg mimics? And, 4. How often have egg mimics evolved in Passiflora? Have they evolved in similar or different ways, and has their presence influenced species diversification in the groups that have them?

Authentic butterfly eggs of Heliconius hewitsoni *on* Passiflora pittieri.

Thus far, my research has been able to address each of the proposed questions. Egg mimics may be located on the leaf, petiole, stipule, or floral structures of the plant, and 25 species are known to have them. My study is ongoing, but they have evolved at least five times. Each mimic is unique with respect to shape, size, and location. Abundant druses are a common feature, but tissues differ in terms of cell shape, cell composition, and secretory function. Egg mimics display yellow or orange coloration. Interestingly, there seems to be a dual function associated with some egg mimics: not only do they prevent female butterflies from laying eggs, but they also secrete sugar to attract ants that then destroy butterfly eggs.

Egg mimicry demonstrates how an intricate ecological association can exist between several organisms and be mediated by underlying morphology and anatomy of structures. My research demonstrates how understanding the structural details of the various types of egg mimics present in the passionflowers reveals connections necessary for understanding their diversification, development, and evolution.

The Earl Core Student Award has allowed me to continue investigating these interesting questions by enabling me to purchase additional anatomical supplies.

Passiflora poslae *displaying the egg mimic and nectaries.*

Anna Nichole Long-Aragon is a graduate student at the University of Southern Mississippi. Her research advisor is Dr. Mac Alford.

From The Editor's Desk:

Joe Pollard, Newsletter Editor

I have been serving as editor of this newsletter for about three years now. I volunteered for the job because I had always enjoyed reading Chinquapin, and because I thought Dan Pittillo had earned the right to hand it over to someone else. So I came into the position with no real inclination to shake things up or make big changes. Perhaps the scariest thing for me was whether I could find authors to fill the pages; therefore, I made it a point to cultivate the relationships with regular contributors that had been established by the earlier editors. George Ellison's "Botanical Excursions" column has appeared in Chinquapin since volume 1, issue 1, way back in 1993! The "Taxonomic Advisory" series by Alan Weakley and "Rare Plants" by Linda Chafin were established in 2008 during Scott Ranger's term as editor. I am indebted to all of them for continuing to submit articles. Their three distinctive voices contribute greatly to the entertaining but informative tone that I wanted Chinquapin to keep.

The other regular column that I inherited in 2013 was Lytton Musselman's series on the fascinating lives of parasitic plants, which I believe was inaugurated in 2011. But I have to admit that this one worried me! Nothing personal about Lytton, I assure you. He has always submitted his pieces well before the deadline with a minimum of editorial prompting. But the subject matter seemed distressingly … well … *finite*. There will always be taxonomic and nomenclatural changes for Alan to inform us about. Rare plants are, paradoxically, becoming more and more common, so Linda will never lack for material. And I am totally confident that George has an unlimited trove of fascinating natural history stories, all lovingly illustrated with Elizabeth's watercolors. But parasitic plants? Surely they would run out too soon!

Well, it has happened. Lytton wrote me last June to say that he would exhaust his list of parasites at the end of the year. Oh no! But in the next sentence he offered to begin a new regular column on edible wild plants. It was immediately obvious that this was a brilliant idea. Of course everyone is interested in things they can (and cannot) eat, and Lytton is an acknowledged expert in ethnobotany; he has even written a book on edible plants. But from my perspective – "from the editor's desk" – the best thing of all is that there must be *millions* of edible wild plants in the world! This is definitely not going to be a short series. Lytton provides a preview of his new column in the article on our back page.

There is actually a point to this rambling column, if you're still reading. In addition to the regular columnists I have named above, I have tried and will continue to try to find volunteers to contribute other interesting works to the pages of Chinquapin. I thank all of my friends who have been willing to do that, and I especially applaud the efforts of our student members, such as the front-page article in this issue. But there is always a need for new voices. If you are interested in writing something for your newsletter, anything from a brief letter-to-the-editor to a scholarly article with references, please don't hesitate to contact me. If you want to nominate someone else, send me a suggestion and I will try to coax them on board. If you want to be a regular contributor, we can talk about that too. Just watch out for those infinite subjects!

In Memoriam . . .

George Pryor Johnson

Dr. George Johnson, Professor of Biology and Curator of the Herbarium at Arkansas Tech University, passed away on December 16, 2015, at the age of 59. Dr. Johnson was a member of the Southern Appalachian Botanical Society and former editor of Castanea. Our thoughts go out to his family and friends.

Reminders:

• Dues notices have been mailed to all members. Pay by mail or online at http://sabs.appstate.edu/membership.

• Abstracts for the 2016 annual meeting are due by February 7. For information go to http://www.sebiologists.org/.

A Shrubby Sandbur, *Krameria lanceolata* (Spreading Ratanay)

By Lytton John Musselman, Old Dominion University, Norfolk, VA

In this series, I have considered Southeastern parasites in the families Cervantesiaceae (with *Pyrularia pubera*, formerly placed in Santalaceae), Convolvulaceae, Lauraceae, Olacaceae, Orobanchaceae, Santalaceae, and Viscaceae. This final article deals with *Krameria lanceolata*, known by the "common name" of ratanay (or rhatany, rattany, or ratany) or, most appropriately for this little-known species, sandbur.

The genus is well-known in desert and arid regions where most of the fourteen or so species occur. Several species of *Krameria* have medicinal use in Central and South America and as an export to Europe. Tannic-like compounds are present in the plant making it a suitable treatment for diarrhea and other ailments. Extracts are usually red in color, perhaps enhancing its appeal as a medicine and wine colorant.

The only representative of this genus in the Southeast is *K. lanceolata* found in southern Georgia and northern and central Florida. It is a low, stoloniferous shrub with simple, hairy alternate leaves and dimorphic roots; a thick fleshy taproot and thin, spreading

Figure 1. Single shrub of spreading ratanay near Post, Texas in full flower.

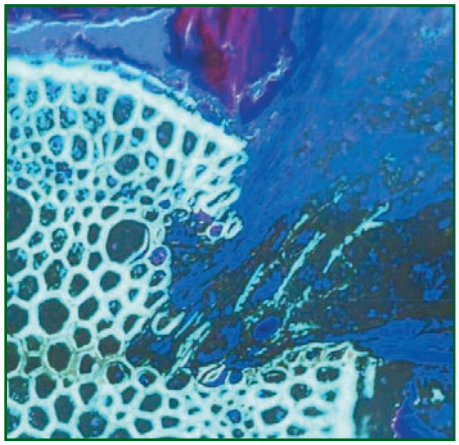


Figure 2. Haustorium of K. lanceolata *invading wiregrass (*Aristida *sp.). The host is lower left.*

adventitious roots (Fig. 1). For this reason it is sometimes called spreading ratanay. The parasitic attachments, the haustoria, arise from the adventitious roots.

Haustoria have a distinct anatomy but in overall shape and function resemble those of other root parasites (Fig. 2). And like most of our hemi-parasites (parasites containing chlorophyll) *K. lanceolata* has a broad host range. In central Florida I found haustoria on roots of longleaf pine (*Pinus palustris*), turkey oak (*Quercus laevis*), saw palmetto (*Serenoa repens*), and prickly pear cactus (*Opuntia humifusa*); herbaceous dicots and grasses were also hosts.

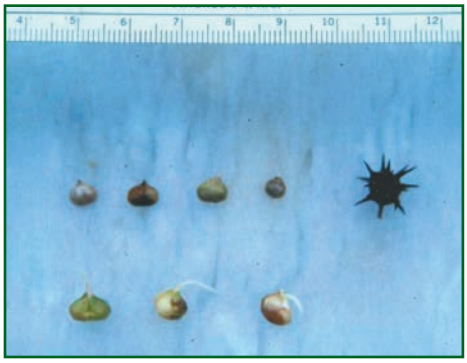
Figure 3. Flower of K. lanceolata. *The semi-circular oil glands are evident at the base of the ovary. Broxton Rocks Preserve, Georgia in April.*

The flowers are attractive and at first glance resemble those of a legume. For this reason *Krameria* was once aligned with the Fabaceae. Further investigation suggested it is more closely related to the Polygalaceae (milkwort family). Presently it is the only genus in the Krameriaceae, a family in the Zygophyllales in the Rosid clade.

Much of the confusion over family affiliation was based on the flowers; their morphology puzzled botanists for years. It is one of the few genera producing oil as a reward for pollinators. The oil is produced in two highly modified petals at the base of the ovary (Fig. 3).

These flowers produce a single-seeded fruit that bears an amazing resemblance to the fruiting structure of the grass known as sandbur (*Cenchrus* spp.), an obvious adaptation for animal dispersal (Fig. 4). Hence, one of the common names for *K. lanceolata* is sandbur.

Figure 4. Left- Fruit, seeds, and germinating seeds. No host stimulant is necessary to germinate seeds. Right-retrorsely armed barb from spine of fruit, ensuring the barb remains in the fur or flesh!



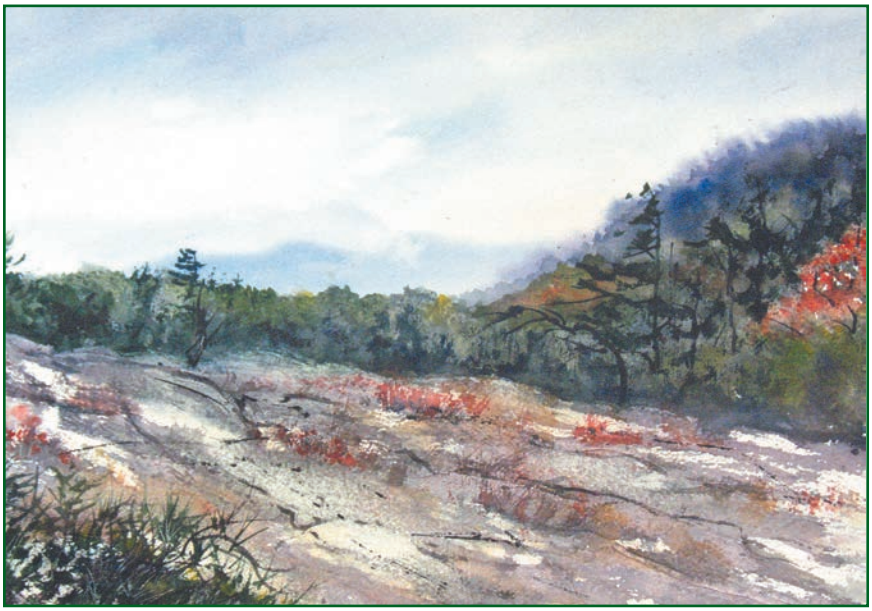
BOTANICAL EXCURSIONS

Montane Red Cedar-Hardwood Woodland:

A Recently Recognized Natural Community of the Southern Blue Ridge Province

By George Ellison, with artwork by Elizabeth Ellison

Like wine that comes from a barren stone
Dearly departed and calling home
I long to be on a cedar glade
--Angela Faye Martin, "Cedar Glade" (2015)



Mountain Red Cedar – Hardwood Woodland, by Elizabeth Ellison

Even though the Appalachians may not be—as is often supposed—the oldest mountain chain in the world, they are now passing through the mature phase such violently uplifted terrain experiences as it ages, erodes, and becomes diverse in two regards: plant life and distinctive natural communities.

Those benchmarks of diversity apply to the entire range from the Gaspé Peninsula in Canada to the foothills of Alabama. But the greatest diversity, in both regards, is attained in the Southern Blue Ridge Province (SBRP), which extends from just south of the Roanoke River Gap in Virginia to Mt. Oglethorpe in north Georgia, encompassing portions of east Tennessee, western North Carolina, and northwest South Carolina. Featuring fifty (or so) peaks exceeding 6,000 feet and crisscrossed by an array of ranges and waterways, it is one of the most elegant and complex temperate deciduous landscapes in the world.

In the introduction to *Guide to the Natural Communities of North Carolina: Fourth Approximation* (2012), Michael P. Schafale defines a natural community as "a distinct and reoccurring assemblage of populations of plants, animals, bacteria, and fungi naturally associated with each other and their physical environment."

Schafale noted that the definition "implies an attempt to account for a wide variety of ecological components, so that the units will represent differences in local-scale ecosystem function and structure."

I'm not a biologist by training, but through the years one of my pleasures has been locating, exploring, and writing about the dynamics of various natural communities located in the SBRP. Initially relying on printed sources like Charles Wharton's *The Natural Environments of Georgia* (1978); *Charles Roe's A Directory to North Carolina's Natural Areas* (1987); and Alan Weakley and Michael P. Schafale's *Classification of the Natural Communities of North Carolina: Third Approximation* (1990), I was able to form an understanding of the larger forest zones differentiated primarily by elevation: spruce-fir; northern hardwood; cove hardwood; southeastern hardwood; and pine-oak-hickory.

Many of the somewhat less extensive natural communities then started to fall into place like pieces in a jigsaw puzzle: Canada hemlock gorges and Carolina hemlock bluffs; high-elevation red and white oak forests; escarpment gorges, and alluvial systems associated with various geologic and vegetative situations.

Embedded within the framework of those interrelated forest and alluvial systems is a mosaic of less extensive natural areas and ecosystems (Schafale's "local scale" communities) that have been, for me, the most exciting to look for and explore: colluvial flats associated with high-elevation periglacial boulderfields (block streams) and low-elevation talus slopes; swamps, marshes, and bogs; grassy and heath balds; "hanging gardens" comprised of seeps, spray cliffs, and sphagnum mats; serpentine and pine barrens; dwarf white oak "wind forests," beech gaps and fern glades; and rocky summits, domes, and cliffs.

That's the long-winded explanation of why I perked up a few months back when I heard my friend Brent Martin, director of the Southern Appalachian region of the Wilderness Society, talking on the telephone with someone about "cedar glades" in Macon County, North Carolina.

I had observed Eastern red cedar glades and barrens in the calcareous soils and on the limestone ledges of middle Tennessee west of the Cumberland Plateau and along I-81 in the Ridge and Valley Provinces of Tennessee and Virginia. In Wharton's *The Natural Environments of Georgia* I'd read about cedar glades on "low, flat, north-south trending limestone ridges … in the Chickamauga Valley." (The photo accompanying Wharton's commentary shows a dense stand of conical-shaped red cedar trees, some of which have spires extending 50-60 feet high and widths just above ground level of perhaps 25 feet). And having grown up in Danville, Virginia, I

Cedar Glade continued on Page 29

Cedar Glade continued from Page 28

knew there were scattered populations of red cedar in neutral (diabase) soils found in the Piedmont Province. But to my surprise I wasn't aware of any cedar glades in the heart of the SBRP not many miles south (as the crow flies) of where I've been living for more than 40 years.

Brent explained that he hadn't been talking about "cedar glades" of the sort found elsewhere, but of a rare natural community more properly described as a Montane Red Cedar-Hardwood Woodland (MRC-HW) found primarily (but not exclusively) on south-facing outcrops in the Fishhawk, Cowee, and Nantahala mountains in the general area embraced by the towns of Franklin, Highlands, Cashiers, and Sylva. When I asked Brent if we could go see one, he remarked that it was one of his favorite natural communities and arranged for me to meet him and his wife, Angela, a singer and songwriter, at the Bi-Lo supermarket on the outskirts of Franklin one afternoon in late November 2015.

But first a taxonomic digression is in order. I've often wondered about the various shapes red cedar can display—from tall and conical to short and rounded—even when in close proximity of one another. Over the years, some botanists have attempted to name some of these growth forms as distinct species, subspecies, or varieties. In his 2008 monograph on the genus, the noted *Juniperus* authority R. P. Adams listed at least 10 names that have been used for different forms of red cedar in the past. However, he concludes that they all belong to one species, and that the only distinction deserving taxonomic recognition at all is between the common and widespread Eastern red cedar (*Juniperus virginiana* var. *virginiana*) and Southern red cedar (*J.v.* var. *silicicola*), which grows along the Atlantic and Gulf coasts. Apparently all those other growth-forms blend into each other, subject to both genetic and environmental variation, and are not worthy of any sort of scientific name.

Upon arrival at the Bi-Lo parking lot, I found that Brent had assembled a "Who's Who" of MRC-HW authorities, including Dr. J. Dan Pittillo, founder and longtime editor of this newsletter. In the early 1990s his assistant for field surveys, Bob Dellinger, was the first to recognize the uniqueness of these sites. Dellinger and Pittillo filed Survey Reports in 1993 and 1994, calling attention to the sites. And in 1998, Christine J. Small and Thomas B. Wentworth published "Classification of Montane Cedar-Hardwood Woodlands in the Piedmont and Blue Ridge Provinces of North Carolina" in Castanea, "with the overall goal" of securing recognition for the habitat by "the North Carolina system of natural community classification," which was officially implemented when the "Fourth Approximation" of Schafale's *Guide to the Natural Communities of North Carolina* was published in 2012.

Others taking part in the outing to Cedar Knob, one of the more "accessible" (relatively speaking) of the MRC-HW sites in Macon County were Ed Swartzman, the biologist who prepared substantial inventories of the natural areas for Transylvania (2008) and Macon (2010) counties, as well as the site survey report for Cedar Knob; Dr. Gary Wein, executive director of the Highlands-Cashiers Land Trust, which manages many of the MRC-HW sites on private lands, including the one at Cedar Knob; Kyle Pursel, stewardship coordinator for the HCLT; and Jack Johnston, *Magnolia* and *Stewartia* savant extraordinaire.

Group photo (L-R): Ed Swartzman, Kyle Pursel, George Ellison, Brent Martin, Dan Pittillo, Gary Wein, and Jack Johnston. (Photo credit: Angela Faye Martin)

All of us piled into Gary's Dodge truck, which he navigated up the "roadway" (so to speak) as if piloting a motorboat, pausing only in hairpin switchbacks perched on the mountainside to shift gears. Kyle met us near the top. Anyone familiar with nature walks can tell when a group is anticipating (or not anticipating) the return to a familiar place. In this instance, my companions were clearly happy to be where we were and anxious to get where we were going.

And I could see why once we emerged from the dim laurel thicket at the head of the sloping rock face. Suddenly there was all this light. It was sort of like stepping out onto an open-air stage where you could wander along exposed rock corridors lined by extensive areas of lichen-encrusted stone or pause beside a stand

Kyle and George at the head of a rock corridor, with red cedar in background (Photo credit: Angela Faye Martin)

Cedar Glade continued on Page 31

Botanical Brainteasers

By Joe Pollard and Janie Marlow

Our fall Brainteasers [Chinquapin 23(3)] were (1) *Trillium cuneatum*, (2) *Sagittaria latifolia*, (3) *Pityopsis graminifolia* (sometimes included in *Chrysopsis* or *Heterotheca*), (4) *Smilax herbacea* and (5) *Arisaema triphyllum*. The puzzle was to identify the odd one out, but also to explain why all five are "rule-breakers" that could frustrate a novice. In learning to key out flowering plants, the first fork of a dichotomous key often involves a decision about whether the plant belongs to the monocots or dicots (or more formally, eudicots plus basal groups). We teach our students that most monocots have parallel-veined leaves, whereas most dicots have net-veined leaves. We warn them there are exceptions, but they never seem to hear that part.

All five of these plants are exceptions. At least superficially, it seems that numbers 1, 2, 4, and 5 have an obvious network of veins in their leaves; however, all four of those species are monocots. On the other hand, number 3 certainly appears to have parallel veins but is a eudicot in the family Asteraceae. It's the odd one out.

Once again, we had a tie for first place. The first two responses, submitted on the same day, nailed the identifications and the puzzle perfectly. They were from first-time player Chris Havran and regular participant Sam Pratt. Congratulations to both!

The next Brainteaser takes a somewhat more ecological approach, but that's about the only clue we'll give you. As usual, you need to identify these five plants, tell us the common thread that connects four of them, and explain why one of them doesn't really belong here. Color photos will be posted online at http://sabs.appstate.edu/chinquapin-issues. (We had a technical delay doing that last time; apologies!)

Please address all correspondence regarding Botanical Brainteasers to joe_pollard@att.net. (That's an underscore character between first and last names.) If you prefer, send snail-mail to Joe Pollard, Biology Department, Furman University, 3300 Poinsett Highway, Greenville, SC 29605. Images are ©JK Marlow.

Cedar Glade continued from Page 21

of red cedar that wouldn't be too much out of place in someone's bonsai garden.

Here is Ed Swartzman's description (culled from his *Inventory of Macon County*) of a prototypical Montane Red Cedar natural community:

"Also referred to as Montane Red Cedar-Hardwood Woodlands, these rocky habitats are typical features of the Fishhawk Mountain range, the southern Nantahalas, and the Cowee Mountains in Macon County. Cedar glades most often occupy steep south-southeast-facing slopes with exposed outcrops and rocky woods. The glades and woodlands appear to be associated with a southwest-northeast trending geological contact zone between the metasandstone of the Dahlonega Gold Belt and gneiss and amphibolite of the Cartoogechaye Formation. These geological conditions create the setting for these unique cedar outcrops and woodlands, which in turn support a number of unusual plant species.

"The large cedar glade that extends from Cedar Cliff to Ammons Knob in the Fishhawks provides an excellent example of the vegetation so characteristic of these unusual communities. The woodland canopy is dominated by eastern red cedar, often with pines and hardwoods like Biltmore ash (*Fraxinus americana* var. *biltmoreana*), hickories, and chestnut oak. Understory and shrub species include fringe tree, ninebark, and Carolina rose. … A diverse suite of plants more typical of grasslands and prairies grow within the open glades. Warm-season grasses like big bluestem, little bluestem, and Indian grass are especially common.

Rare coal skink missing tail, in Kyle's hand (Photo credit: Kyle Pursel)

"A number of rare plants are known from the glades, including one of our showiest wildflowers, eastern shooting star (*Primula meadia*). Other rare species such as granite dome goldenrod (*Solidago simulans*), divided-leaf ragwort (*Packera millefolium*), round-leaf serviceberry (*Amelanchier sanguinea*), cliff stonecrop (*Sedum glaucophyllum*), and northern panicgrass (*Dichanthelium boreale*) can be found as well.

"Mosses, liverworts, and lichens cover most rock and tree surfaces throughout the woodlands. Sullivant's golden manedmoss (*Macrocoma sullivantii*), a rare species of moss that lives on gnarled old red cedar trees, grows in these Fishhawk Mountain glades.

"Rare butterflies, gold-banded skipper (*Autochton cellus*) and tawny crescent (*Phyciodes batesii maconensis*), are known to inhabit the cedar glades, where they feed on legumes and asters that are common in the openings."

I suspect that Kyle, in the course of his duties as a stewardship coordinator for the Highlands-Cashiers Land Trust, has spent as much or more time on and in the MRC-HW communities as anyone. Kyle is sort of stoic in demeanor. But anytime we talked during the outing or subsequently communicated via telephone or email his affection for the red cedar glade communities come shining through. He doesn't begrudge the copperheads or timber rattlers their place in the sun. The fence lizards are really fast. You catch a rare coal skink with your bare hand by not grabbing where he is but where you anticipate he might be. If his tail breaks off—well then it'll grow back.

And no matter what anyone says, it's a blessing to be able to add yet another natural community to the list of "local-scale ecosystems" I've visited—with the help of others—in the far-back places of the Southern Blue Ridge, where the plants and the animals and the landscapes are free to go about their interrelated tasks as they have for so many thousands of years.

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Coming Soon: New Series on Edible Wild Plants

"A book is never, ever finished, only interrupted by publication" my friend Garrison Keillor wrote me about his forthcoming book deadline. My work *The Quick Guide to Edible Wild Plants* (with co-author Harold Wiggins) is unfinished, though I am thankful it was interrupted by publication by Johns Hopkins University Press in 2013.

It is unfinished because much more could be added.

Our book was conceived as a sort of combination botanical Cliffs Notes and Food Network recipes, with simple but adequate information ensuring the leafy greens steaming in the pot were not poison hemlock and that a palatable—contra delectable—food could be quickly prepared with a minimum of non-wild elements. This is my approach to wild edibles—simplicity, bulk of product from wild plants.

Since the book appeared I have learned so many new plants to eat and realized how much more there is to learn. One example from a familiar tree will suffice.

Native Americans' apparent preference for hickory nuts (species of the genus *Carya*) over black walnut (*Juglans nigra*) puzzled me because of the hickory nuts' smaller size and the difficulty extricating the nutmeat compared to the larger, meatier black walnut. The reason is the nature of the stony wall of both. Black walnut is furrowed and pitted while the hickory wall is smooth. When hickory nuts are smashed and put in water the nutmeat is easily retrieved but removing black walnut from the rough surface of shell fragments is difficult.

Wild plants and their food products often taste markedly different from our quotidian food. For that reason my advice to those lost in the forest is to find the highest tree, climb it and look for the Golden Arches.

But the serious field botanist is curious about all the plants she/he encounters. In this series I want to explore not only well-known wild edibles, but those less familiar. For example, obtaining syrup from black walnut trees. Or witloof Belgian endive from common chicory. Or steamed sliced turions from lotus. Or one of my favorites, a cordial made from the under-appreciated fruits of deerberry (*Vaccinium stamineum*). And there are so many more.

Having worked as an ethnobotanist in several parts of the world I have become aware that the concept of distinguishing native, wild plants from cultivated food plants is not recognized in most societies. For example, in Iraq one of the delicacies of the spring is the young shoots of *Gundelia tournefortii* (Asteraceae); piles of these clog the narrow labyrinthine bazaar in Sulaimani. While the attraction of this thistle with an unremarkable taste and noteworthy prickles eludes me, it is greatly relished. Locals would not consider it different than something grown on a farm. Another example is the starch collected from *Metoxylon sagu* (a tree rattan in the Arecaceae, the palm family) that is boiled in Borneo to prepare what can only be described as bland slime, at least without the tasty toppings used to make it palatable. There are more examples, all of which remind me that in the United States most citizens are far removed from the plants they eat. Our ancestors made much greater use of wild edibles; I sense a renewed interest that I hope these articles will stimulate.

The usual warnings are necessary—consider allergies, plants collected from polluted sites, variability of wild plants (much greater than cultivated plants), deadly look-alikes. I'll try to round up all the usual suspects of concern.

I would like this series to be as interactive as possible so hope you will share your recipes. The blogosphere is new to me – bear with the bare bones of my newly established site at http://fs.wp.odu.edu/lmusselm/

Bon appetit

Lytton John Musselman, Old Dominion University, lmusselm@odu.edu